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ABSTRACT

The approach to continuing education at the Shell Oil Company is discussed. The advantages and disadvantages of different methods of instruction and different formats for continuing education are described. The impact of continuing education is assessed in relation to the following: hiring policies, career development, staff upgrading, promotional policies, and retirement policies. (MLH)

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CONTINUING EDUCATION - A MANAGEMENT POINT OF VIEW

BY

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PANEL DISCUSSION

AMERICAN SOCIETY FOR ENGINEERING EDUCATION

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MANAGEMENT POINT OF VIEW OF CONTINUING EDUCATION

Introduction

It is doubtful that a large corporation has a particular point of view on a topic such as Continuing Education. What it does have is a set of policies and activities that, across the different functions of the corporation, represents the aggregate point of view of those who manage its business. The philosophical support of Continuing Education in Shell is that it contributes toward the more effective job performance of Shell staff.

To a large extent, these views are shaped by historical trends responding generally to a series of specific stimuli. The Shell approach to Continuing Education is shaped by pragmatic considerations. There is little or no broad support for Continuing Education on philosophical grounds. Added education for professionals is not regarded as directly supportable if unstructured and unrelated to the work being performed.

Our point of view, therefore, is that Continuing Education has great value when directed at creating or improving job related skills. So the objectives of every educational activity must be clearly defined. And learners must be linked to the activity by their needs at the proper time. In our opinion, it is the job performance of our professionals that counts most in shaping their careers, their promotions, and their ultimate contributions to the business. We believe that job performance can be modified, but not radically changed, by Continuing Education.

The factors that control job performance are various. Technical competence is but one factor and this competence has been fashioned over a lifetime of prior studies. Of equal and perhaps greater importance are the personal qualities that individuals bring to their work. Attributes that include motivation, interest, productivity and capacity for work, creativity, ability to work with others and as a member of a team, initiative, and judgement are critically important. These

characteristics are extremely difficult to change in adult life. And we doubt that Continuing Education can do it.

So like others we emphasize the careful initial selection of our professional staff. We recruit carefully and selectively. We demand evidence of proven academic performance. We insist on high standards, both academically and personally.

I have been asked to discuss our views of Continuing Education as it affects hiring, career development, staff upgrading, promotional policies, and retirement. Because this is an ASEE forum, I intend to dwell mostly on Continuing Engineering Studies as they relate to our technical professionals in engineering. In particular, as they relate to our Production Department.

Methods and Formats

We believe that every training activity must have precise objectives, and we recognize five general ones; (1) to assimilate newly hired staff, (2) to develop specialized job capabilities, (3) to provide interdisciplinary training, (4) to train experienced staff in new procedures, and (5) to convert staff from one area of practice to another. We do this through on-the-job training, work location training, centralized internal training, external training, and independent initiative training.

On-the-job training is traditional and still essential. For our technical professionals we have tried to reduce this to a minimum. But even the best qualified new engineer needs a period of assimilation before he can perform productively. For nontechnical staff, and technical staff in certain functions, on-the-job training remains the most practical approach. Furthermore, for all staff it must be to some extent a career-long way of life.

Work location training covers those events that occur formally or informally at the work location. They include seminars, formal courses, and informal training lectures conducted by supervisors, training representatives, and invited lecturers.

Centralized internal training covers formal courses at a central Company location.

External training covers the formal short courses offered by universities, service companies, and commercial companies or individuals.

Independent initiative training covers courses taken at accredited institutions, and supported by Shell through 100% educational reimbursement. The subject matter must be related generally to the work being performed, or that could be performed. And the course must be satisfactorily completed.

Various methods are used by Shell. They depend upon staff location, the kind of work they are doing, and the kind of training needed. We place heavy reliance on the use of live lecturers. But we have used a variety of methods either in support of, or in lieu of, lecturers. These include audio slide lectures, video tape lectures, films, programmed learning texts, correspondence courses, simulators, commercial and internally generated texts, and computer-assisted self study.

We believe that our corporate program of Continuing Education should be tailored closely to functional activity. Each function must be responsible for developing and conducting its own educational support program. Therefore, we do not have a central training facility run as an entity by a single corporate organization such as Employee Relations. But rather we have several independent facilities that are managed, staffed, and funded by individual functions.

Impact of Continuing Education

On Hiring

Although Shell carries on extensive internal training, and is liberal with outside educational opportunity, we believe the impact on hiring is useful, but small. It has helped the Exploration and Production functions to acquire technical and nontechnical staff through broad recruiting programs. So quota hiring by discipline is not essential.

For example, nearly all of the geophysicists within Shell are trained internally, and candidate professionals come into the program with a variety of degrees. Likewise, many of our engineers practice in specialized fields for which their university degrees have not directly prepared them. The ability to train and retrain engineers for our own specific engineering applications does provide flexibility in hiring.

Furthermore, engineer graduates with limited knowledge of the oil and gas production industry, and with degrees for example in mechanical, chemical, civil, or electrical engineering, can be assured that they will not be asked to perform responsible engineering work before we have qualified them through internal training. This gives them confidence, and we have been able to recruit well qualified engineers who otherwise might have gone elsewhere. On the other hand, an extensive Company run formal program can be counter-productive at times. Some graduating engineers feel they have had enough formal education and do not always relish the prospect of more. Although we are unable to quantify the direct impact, we believe the Shell program to be a plus factor when hiring, but not an essential one.

On Career Development

We believe that our Continuing Engineering studies program is of great importance in career development. In the first place, we want to get the new engineer into engineering practice as quickly as possible. We want to do this for his sake as well as ours. We want our engineers to practice first in the general drilling and production phases of oil and gas production. We do this through early formal training coupled to initial assignments in engineering operations. This combination quickly achieves fairly high and uniform standards. At the same time, it reduces the chance that gaps or errors in knowledge could creep in through a geographically dispersed on-the-job type program. Also it helps to reduce the heavy load on experienced staff that new engineers impose in their early months on the job.

After a year or two of general practice, the engineer moves into one of our specialized areas of applied engineering. About this time, he is formally trained in his specialty, and this training gives him the foundation for his future career as a specialist. Thus we develop the specialized capabilities required of each engineer in a compact manner. And we expose him to the current state of the art, and provide him with documentation, procedures, and sound approaches to engineering applications. We do so without wasting time or permitting trial and error approaches that can lead to costly error and delay. We supplement his training at later dates with sharply focused training when it is needed. So we try to supply each engineer during his career with the engineering tools needed by him in his work. In addition, we expect him to remain up to date in his area of practice, and support him in his efforts to document his work through the publication of reports. We encourage him to join an appropriate professional society, and we provide him the opportunity to attend conferences and seminars as he grows professionally.

Training, assignments, and promotions are integral parts of career planning and administration within Shell. Our educational program through its continuity, consistency, predictability, and its close match with operating practice, gives us a sound basis for forecasting and structuring the career programs of our staff.

Staff Upgrading

An important characteristic of our ongoing internal program is its ability to respond quickly and effectively to an identified need. It is our view that continuing engineering studies plays an important part in upgrading our practicing staff. New technology emerges, and new methods appear. New approaches can take time before being generally used if left to chance. The short course, seminars and workshops, and written reports all play an important part in this process. Short courses sponsored by universities and others also can be important, although a large engineering organization can easily swamp such courses, particularly when others have the same need.

There is a never ending need to provide our staff with information. We introduce new staff on a continuing basis who must be educated and trained in the existing state-of-the-art. We provide new information and techniques that improve on existing procedures. And we ensure that our specialty staffs understand each others problems through interdisciplinary training and exchange of information. Finally, engineers sometimes [illegible] career switches in their areas of practice, or may fall behind through overly narrow specialization.

For these and other reasons, a Continuing Education program is a necessary part of the modern industrial environment. And it plays an essential role in helping an existing staff, both engineering and non-engineering, to meet the challenges that constantly emerge.

On Promotional Policies

In our opinion, Continuing Education has little or no effect on the promotions of our staff. Individual professional accomplishment, and demonstrated performance, are the key factors that lead generally to promotion. We recognize that overall our program accelerates learning and improves performance in our engineers. There are positive indications that the training program lends vitality to our engineering effort. But its universality for our engineers tends to eliminate it as a promotional factor. Since all our engineers receive similar training, the differing characteristics of individual work performance continue to be the key factors considered for promotional decisions.

In some cases, individual engineers follow their own study programs. These include enrollment in outside courses. If such a program should lead to demonstrably improved performance, our standard procedures for evaluation and career planning would take this into account, and promotions might follow. But it is likely that the personal qualities that lead an engineer into independent studies could well be the prime factors that control appraisal, and hence career success might result regardless of independent study.

Moreover in some cases, an active program of independent study could be counter-productive. These efforts take time and energy, and may sap the productivity of an engineer in his regular assigned work. And some lines of independent study can have only a tenuous relationship to our applied engineering work. If these studies are aimed at credit work towards another degree, the effort involved must be regarded as a highly personal ambition. Because for our practicing engineers, we rarely recognize additional courses, or added degrees, as a basis in themselves for promotion.

On Retirement Policies

The considerations that govern promotions to some extent apply with equal force to retirement. Shell has a normal retirement age of 65. But anyone may elect to retire at an earlier age provided they meet certain criteria with regard to age and length of service.

Relatively few technical professionals continue to work until age 65. No doubt there are many factors that enter into this, most of them having to do with individual personal decisions on the part of engineers themselves. However, we believe that all staff regardless of age should play a productive role. Our older engineers have many years of valuable experience, and can contribute much from this experience by example and leadership. It is our view that if performance deficiencies do show up in older staff, the reasons could have little to do with technical deficiencies. When it is a factor, substandard technical performance can be improved occasionally through a Continuing Engineering Studies program. And this is a real possibility for those engineers who return to applied engineering after a period of years in perhaps an administrative or relatively nontechnical job. That is, provided they have retained their motivation and drive to succeed.

We believe generally that other factors are more significant in controlling the older engineer's performance. In any individual case these may include diminished

work capacity, coupled with lessened motivation to achieve, and a diversion of interest and energy into outside activities. Of course, poor health and/or a lack of general well-being may become factors. None of these, however, are inevitable consequences of aging. This is borne out by those engineers who do work completely through their careers with high levels of competence and finely tuned technical alertness.

The engineer who is motivated, vigorous, and interested in his work has little trouble staying abreast of the technical demands placed upon him. And if he does not, then engineering studies are unlikely to be a solution. So by itself, we do not regard continuing education as a significant factor in a retirement decision.

Pros and Cons of Different Methods of Instruction

In our continuing engineering studies program, we prefer classroom instruction using live lecturers. Although it is fashionable to downgrade this approach as old fashioned lock step, it has advantages to us.

Live Teaching

1. The time response to develop new courses and to introduce revised material is fast. Our courses keep varying as we add courses, abandon all or parts of courses, and restructure existing courses.

2. The teaching assignment itself is a valuable self-development tool. By changing instructors, we gain vitality and keep up to date.

3. The classroom brings our teaching professionals, guest professionals, and student engineers together into a highly interactive environment for study of engineering applications.

4. Our classroom environment is one of part lecture, part demonstration, and part problem solving. Computer terminals are at hand to access our engineering program library. We blend in as needed field trips, laboratory studies, films, audio slides and video taped discussions.

5. Our support documentation is extensive and becomes the foundation of each engineer's library. This material is continually revised to reflect current state-of-the-art.

Packaged Teaching

Although we prefer live teaching for engineers, we believe that packaged teaching material has a definite part to play in continuing education. If its use is carefully considered, it can be invaluable. It delivers standard information efficiently to very large groups, or where frequency is high. It is excellent for reaching decentralized groups and individuals. High quality lectures by outstanding individuals can be captured and made available to a wider audience than would be otherwise possible. But some methods are better than others.

Video Tape

After fairly extensive trial, we have concluded that video taped instruction is limited in value for training engineers. It has a number of disadvantages.

1. It requires a major effort to develop taped courses and they are difficult and time consuming to revise once complete. For the results achieved, it is expensive.

2. Even for professionally produced material, there are definite time limits on continuous class exposure. A video taped version of an engineering course takes too long to present using intermittent class schedules. And it becomes almost impossible to keep a class together over a period of weeks or even months.

3. Interaction between class members and instructors is almost completely lacking.

4. A major effort is needed to organize and staff a facility to produce tapes, maintain them and the video tape equipment, ship and monitor the use of the material. To maintain viewing facilities and equipment, and to establish schedules at a number of decentralized points, is even worse.

Audio Slide Lectures

We like this approach, but not especially for engineers. Although each lecture does require sizeable investments in time and energy, the resulting set of slides and audio cassettes can be reproduced cheaply. It uses inexpensive, readily available, and easily operated equipment. 35 mm slides produce sharp details, in

color if needed, at minimum cost. The format is ideal for developing a series of lectures on individual specific topics. They can be revised quite readily. They can be stopped at any point for added discussion if required. Although some of these characteristics are also true of video tape, the audio slide approach is much cheaper, more flexible, and more easily handled by inexperienced people.

Programmed Learning Texts

These are also of considerable value. Although a programmed text is a major undertaking, it has the advantage of being used on an individual basis. Thus, it eliminates the class and associated logistics, and permits an individual to personalize his approach to learning. It can also be a good reference document. But these texts are hard to revise, and they are best suited to covering fairly static doctrine.

Correspondence Courses

We make only limited use of correspondence courses and have made no attempt to develop our own. Most of the topics available in this format have limited value to us, but it does provide a way for individuals to follow a self-study program, and on a credit basis if desired.

Simulators

We find this to be a useful approach to hands-on training. One recent application used by us across the country involves the simulation of well control response for training drilling crews at the well site. For this and other purposes, we are beginning to use travelling classrooms.

Conclusions

Our management strongly supports Continuing Education for Shell Oil Company staff. This support is reflected by what is actually done rather than by Corporate statements of policy. And it assumes that sponsored Continuing Education will be directed at improving job performance.

Shell management believes that Continuing Education has important effects on staff upgrading and career development; a useful impact on hiring technical and nontechnical staff in certain functions; and an indirect but sharply limited effect on their retirement. Continuing Education is considered to have little or no direct impact on staff promotions.

P. F. Chapman
June 6, 1975

OBJECTIVES OF CONTINUING EDUCATION

TO ASSIMILATE NEWLY HIRED STAFF

TO DEVELOP SPECIALIZED SKILLS

TO PROVIDE INTERDISCIPLINARY TRAINING

TO TRAIN EXPERIENCED STAFF IN NEW TOPICS/PROCEDURES

TO RETRAIN EXPERIENCED STAFF

TYPES OF SPONSORED EDUCATIONAL ACTIVITY

SCHEDULED ACTIVITIES - AT WORK LOCATIONS

AT CENTRAL COMPANY LOCATIONS

AT NON-COMPANY LOCATIONS

UNSCHEDULED ACTIVITIES - ON-THE-JOB ASSIMILATION

USE OF PACKAGED MATERIALS AT WORK LOCATIONS

AT INSTITUTIONS THROUGH PERSONAL INITIATIVE

TEACHING METHODS USED FOR CONTINUING EDUCATION

CLASSROOM LECTURES - LIVE

AUDIO SLIDE LECTURES

VIDEO TAPED LECTURES

16MM FILMS

PROGRAMMED LEARNING TEXTS

CORRESPONDENCE COURSES

COMPANY AND COMMERCIALLY PREPARED TEXTS

SIMULATORS

COMPUTER ASSISTED TRAINING

IMPACT ON HIRING OF CONTINUING EDUCATION

LIMITED EFFECTS

REDUCES QUOTA HIRING BY TECHNICAL DISCIPLINE

PROVIDES FLEXIBILITY

ENCOURAGES SOME PROSPECTIVE ENGINEERS

DISCOURAGES A FEW

IMPACT ON CAREER DEVELOPMENT OF CONTINUING EDUCATION

CONSIDERABLE IMPORTANCE

ACCELERATES ENTRY INTO SHELL ENGINEERING PRACTICE

ENSURES QUALITY OF PERFORMANCE

SHIFTS TRAINING LOAD FROM EXPERIENCED STAFF
ON THE JOB

HELPS IN ADMINISTERING CAREER PROGRAMS

IMPACT ON STAFF UPGRADING OF CONTINUING EDUCATION

CONSIDERABLE IMPORTANCE

SUPPLIES MODERN STATE-OF-THE-ART INFORMATION

PROVIDES NEED TO KNOW NEW MATERIAL

FOSTERS INTERDISCIPLINARY INFORMATION EXCHANGE

PERMITS INTERNAL CAREER SWITCHING

IMPACT ON PROMOTIONAL POLICIES OF CONTINUING EDUCATION

OF LIMITED IMPORTANCE

PROMOTIONS ARE BASED ON INDIVIDUAL PERFORMANCE

GENERAL INTERNAL TRAINING APPLIES TO ALL ENGINEERS

INDIVIDUAL PROGRAM CAN BE COUNTER-PRODUCTIVE

IMPACT ON RETIREMENT POLICIES OF CONTINUING EDUCATION

OF LIMITED IMPORTANCE

MID AND LATE CAREER ROLE CHANGES EXTEND WORKING LIVES

NONTECHNICAL FACTORS TEND TO CONTROL LATE CAREER PERFORMANCE

LATE CAREER PERFORMANCE RELATIVELY IMMUNE TO CHANGE BY EDUCATIONAL ACTIVITIES

PROS AND CONS OF INSTRUCTIONAL METHODS

FAVOR LIVE LECTURES IN CLASSROOM ENVIRONMENT

LIVE LECTURING IS FLEXIBLE AND RESPONSIVE TO NEEDS

PERSONAL INTERACTION HIGHLY IMPORTANT FOR BEST RESULTS

PACKAGED PROGRAMS ARE IMPORTANT

PACKAGED PROGRAMS PLAY SUPPORT ROLE FOR ENGINEERING USE

PACKAGED PROGRAMS PLAY A PRIME ROLE IN DELIVERY TO NON-ENGINEERS

PACKAGED PROGRAMS ALSO IMPORTANT FOR DELIVERY OF NONTECHNICAL INFORMATION TO ENGINEERS

VIDEO TAPED APPROACH HAS FAILED

AUDIO SLIDE LECTURES AND PROGRAMMED TEXTS HAVE BEEN SUCCESSFUL

EVERY METHOD HAS A USEFUL APPLICATION

CONCLUSIONS

SHELL SUPPORTS CONTINUING EDUCATION BY SPONSORING A VARIETY OF PROGRAMS. SHELL BELIEVES THAT CONTINUING EDUCATION SHOULD BE AIMED AT IMPROVING JOB PERFORMANCE. SHELL VIEWS CONTINUING EDUCATION AS:

IMPORTANT FOR STAFF UPGRADING AND CAREER DEVELOPMENT

USEFUL FOR HELPING HIRE WELL QUALIFIED PEOPLE

OF LIMITED USE IN DELAYING RETIREMENT

OF LITTLE OR NO USE IN DECIDING STAFF PROMOTABILITY